

Claims

What is claimed is:

- 1 1. A storage area network (SAN) management and configuration
2 method via enabling in-band communications comprising the steps of:
3 utilizing a SAN management application for communicating with a
4 device driver, and
5 providing a pass through by said device driver through a host bus
6 adapter (HBA) for passing communications to a device in the storage area
7 network from said SAN management application.
- 1 2. A storage area network (SAN) management and configuration
2 method as recited in claim 1 wherein the step of utilizing said SAN
3 management application for communicating with a device driver includes the
4 step of providing a management application agent coupled between said
5 SAN management application and said device driver.
- 1 3. A storage area network (SAN) management and configuration
2 method as recited in claim 2 includes the step of utilizing said management
3 application agent for providing predefined, fibre channel standard, protocol
4 functions for communicating with said device in the storage area network.
- 1 4. A storage area network (SAN) management and configuration
2 method as recited in claim 3 wherein the step of providing predefined
3 protocol functions for communicating with said device in the storage area
4 network include the step of providing a common transport (CT) protocol
5 function and an extended link service (ELS) protocol function.
- 1 5. A storage area network (SAN) management and configuration
2 method as recited in claim 4 wherein the step of providing a pass through by
3 said device driver through a host bus adapter (HBA) includes the step of
4 providing a common transport (CT) pass through and an extended link
5 service (ELS) pass through by said device driver through said host bus
6 adapter (HBA).

1 6. A storage area network (SAN) management and configuration
2 method as recited in claim 1 wherein the step of providing said pass through
3 by said device driver through a host bus adapter (HBA) for passing
4 communications to a device in the storage area network from said SAN
5 management application includes the step of providing said pass through for
6 passing a plurality of commands.

1 7. A storage area network (SAN) management and configuration
2 method as recited in claim 6 includes the step of providing said pass through
3 for passing at least one topology analysis command.

1 8. A storage area network (SAN) management and configuration
2 method as recited in claim 6 includes the step of providing said pass through
3 for passing at least one performance analysis command.

1 9. A storage area network (SAN) management and configuration
2 method as recited in claim 6 includes the step of providing said pass through
3 for passing at least one attribute analysis command.

1 10. A storage area network (SAN) management and configuration
2 method as recited in claim 6 includes the step of providing said pass through
3 for passing at least one configuration command.

1 11. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications comprising:
3 a storage area network (SAN) management application for
4 communicating with at least one SAN-connected host system;
5 said SAN-connected host system including a management application
6 agent for communicating with a host bus adapter (HBA) device driver;
7 said HBA device driver for communicating with a device in the storage
8 area network; said HBA device driver including at least one pass through
9 service for passing a plurality of commands to said device in the storage
10 area network.

1 12. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications as recited in claim 11
3 wherein SAN-connected host system includes a fibre channel hierarchy and
4 a standard HBA device driver interface.

1 13. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications as recited in claim 12
3 wherein said at least one pass through service bypasses said standard HBA
4 device driver interface and a plurality of upper layers of said fibre channel
5 hierarchy.

1 14. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications as recited in claim 13
3 wherein said plurality of upper layers of said fibre channel hierarchy includes
4 a small computer system interface (SCSI) protocol driver, an upper level
5 protocol (UPL) mapping, and a common services layer.

1 15. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications as recited in claim 11
3 wherein said at least one pass through service for passing said plurality of
4 commands to said device in the storage area network include at least one
5 topology analysis command and at least one attribute analysis command.

1 16. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications as recited in claim 16 further
3 includes at least one performance analysis command and at least one
4 configuration command.

1 17. A storage area network (SAN) management and configuration
2 apparatus via enabling in-band communications as recited in claim 11
3 wherein said management application agent provides predefined protocol
4 functions for communicating with said device in the storage area network;
5 said predefined protocol functions including a common transport (CT)
6 protocol function.

- 1 18. A storage area network (SAN) management and configuration
- 2 apparatus via enabling in-band communications as recited in claim 11
- 3 wherein said management application agent provides predefined protocol
- 4 functions for communicating with said device in the storage area network;
- 5 said predefined protocol functions including an extended link service (ELS)
- 6 protocol function.